

Our ref: NIA/6847/16/6813/v2/Station Avenue, Chirk

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Mr Richard Lomas
Planning Manager
Commercial & Investment Property
The Coop Group
5th Floor
1 Angel Square
Manchester
M60 0AG



Sent by email only richard.lomas@co-operative.coop

Dear Sirs,

**NOISE IMPACT ASSESSMENT FOR PROPOSED (OUTLINE) RESIDENTIAL DEVELOPMENT
LAND TO THE NORTH OF STATION AVENUE, CHIRK, WREXHAM, LL14 5LT**

1.00 INTRODUCTION

- 1.01 Environmental Noise Solutions Limited has been commissioned by The Coop Group to carry out a noise impact assessment for a proposed (outline) residential development (circa 24 dwelling houses) at land to the north of Station Avenue, Chirk, Wrexham, LL14 5LT (hereafter referred to as the application site).
- 1.02 The objectives of the noise impact assessment were to:
- Determine the ambient noise climate at the application site
 - Assess the potential impact of the ambient noise climate on the proposed development with reference to the National Planning Policy Framework Planning Practice Guidelines on Noise and other pertinent guidance
 - Provide outline recommendations for a scheme of sound attenuation works, as necessary
- 1.03 This report details the methodology and results of the assessment and provides recommendations for the building envelope (fenestration and ventilation). It has been prepared to accompany an outline planning application to be submitted to the Local Planning Authority for the proposed residential development of the application site.
- 1.04 This report has been prepared for The Coop Group for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties making reference to the report should consult The Coop Group and ENS as to the extent to which the findings may be appropriate for their use.
- 1.05 A glossary of acoustic terms used in the main body of the text is contained in Appendix 1.

2.00 APPLICATION SITE SETTING & PROPOSED (OUTLINE) RESIDENTIAL DEVELOPMENT

- 2.01 For reference, the application site is located in a mixed use setting. Irregular in shape, it is bound by (see Appendix 2 for location plan):
- Open land to the north (Kronospan Wood Processing considerably further north)
 - Station Avenue to the south (residential dwellings opposite)
 - Chirk Sports & Social Club to the east
 - Open land to the west (Cadbury's UK considerably further west)
- 2.02 The proposed (outline) residential development consists of circa 24 dwelling houses with associated gardens and infrastructure (see Appendix 3 for proposed site illustrative master plan).

3.00 BASELINE NOISE SURVEY

- 3.01 In order to establish the ambient and background noise levels at the application site, a baseline noise survey was undertaken on Monday 25th and the Tuesday 26th July 2016.
- 3.02 For the purpose of the assessment, the following noise monitoring positions were adopted in a free field environment at 1.5 metres above ground level (see Appendix 3 for reference):
- MP1 was located along the western boundary at circa 15 metres to Station Avenue
 - MP2 was located along the western boundary at circa 30 metres to Station Avenue
 - MP3 was located along the western boundary at circa 120 metres to Station Avenue (representative of the northern most residential development footprint)
- 3.03 Noise measurements were undertaken using a Bruel & Kjaer 2250 Type 1 integrating sound level meter. The measurement system calibration was verified immediately before the commencement of the measurement sessions and again at the end, using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted.
- 3.04 Measurements consisted of A-weighted broadband parameters, together with linear third octave band L_{eq} levels. The following table contains a summary of the noise measurement data, rounded to the nearest decibel.

Table 3.1 – Noise Measurement Data

Position	Date	Time	L _{Aeq,T} (dB)	L _{A90,T} (dB)	L _{A10,T} (dB)	L _{A1,T} (dB)	Comment
MP1	25/07/16	1237–1337	51	44	54	59	Station Avenue traffic (circa 180 vehicles / hour day)
		1337–1437	51	45	54	59	
		1437–1537	51	44	54	59	
		2326–2341	42	39	44	50	
	26/07/16	0056–0111	41	38	43	46	
Daytime ambient noise level circa 51 dB L _{Aeq} Night time ambient noise level circa 42 dB L _{Aeq}							
MP2	25/07/16	1257–1312	48	44	50	53	Station Avenue traffic
Daytime ambient noise level circa 48 dB L _{Aeq} Indicates line source propagation from Station Avenue							
MP3	25/07/16	1346–1446	49	46	50	53	Distant plant Broadband anonymous character (i.e. not tonal, not impulsive)
		2344–2359	44	42	45	46	
	26/07/16	0038–0053	43	41	44	46	
Daytime ambient noise level circa 49 dB L _{Aeq} Night time ambient noise level circa 44 dB L _{Aeq}							

- 3.05 The ambient noise climate at the southern part of the (red line) application site was road traffic on Station Avenue. At MP1 the ambient noise levels were circa 51 dB L_{Aeq} during the daytime and 42 dB L_{Aeq} during the night time. The proposed site illustrative master plan shows that the nearest residential dwellings to Station Avenue are perpendicular to the road. Due to a reduced angle of view (90 degrees rather than 180 degrees), the ambient noise levels incident upon the dwelling façade would be 3 decibels lower than those measured at MP1.
- 3.06 The ambient noise climate in the central part of the (red line) application site (representative of the northernmost residential development footprint as the 'thin' wedge of land in the northern part of the application is undeveloped; see Appendix 3) was distant traffic and relatively quiet distant plant (which was anonymous in character i.e. broadband, not tonal nor impulsive).
- 3.07 The ambient noise climate at the proposed residential development footprint is relatively low.
- 3.08 Although Planning Policy Guidance 24 (PPG 24) has been superseded by the National Planning Policy Framework, it is noteworthy that the proposed residential development footprint falls within PPG 24 Noise Exposure Category A with the (then) associated guidance being '*noise need not be considered as a determining factor in granting planning permission*'. This illustrates the relatively low ambient noise levels across the proposed residential development footprint.

3.09 It is understood that noise monitoring was also undertaken by Nick Minshall, Pollution Control Officer, Wrexham County Borough Council on the evening of Monday 23rd January 2017. The following noise levels (rounded to the nearest decibel) were measured at the northern end of the proposed development footprint:

- 2305 to 2320 hours and 2323 to 2338 hours (similar levels for both periods)
- 52 dB L_{Aeq}
- 50 dB L_{A90}
- 53 dB L_{A10}
- 56 dB L_{AFMax}

3.10 Whilst these noise levels are higher than those measured by ENS, in absolute terms such external noise levels from steady continuous sources are not significant.

3.11 Although Planning Policy Guidance 24 (PPG 24) has been superseded by the National Planning Policy Framework, it is noteworthy that (based on the noise levels measured by the Local Authority) the (northern end of the) proposed residential development footprint falls within PPG 24 Noise Exposure Category B with the (then) associated guidance being '*Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise*'. This illustrates (that based on the noise levels measured by the Local Authority) that in absolute terms such external noise levels from steady continuous sources are not significant.

4.00 NOISE IMPACT ASSESSMENT

4.01 British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings' (BS 8233) sets guideline indoor ambient noise levels for residential dwellings' as reproduced in the following table.

Table 4.1 – Indoor Ambient Noise Levels in Dwellings (BS 8233:2014)

Location	Good Internal Ambient Noise Levels		Reasonable Internal Ambient Noise Levels	
Living Room	35 dB L_{Aeq} (0700–2300)	n/a	40 dB L_{Aeq} (0700–2300)	n/a
Bedroom	35 dB L_{Aeq} (0700–2300)	30 dB L_{Aeq} (2300–0700)	40 dB L_{Aeq} (0700–2300)	35 dB L_{Aeq} (2300–0700)

4.02 Note 5 to the above table states '*If relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level. If applicable any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.*' It is therefore evident that BS 8233 (and for reference Building Regulations Approved Document F 'Ventilation') consider that trickle ventilators provide adequate ventilation.

4.03 Based on measurements taken at numerous sites, a typical standard double glazed window with trickle vents in a building façade provides circa 27 dB(A) sound insulation from external to internal; see Appendix 4.

4.04 Based on the noise levels measured by the Local Authority) at the (northern end of the) proposed residential development footprint, the resultant internal noise levels (with windows closed and trickle vents open as required by BS 8233 and Building Regulations ADF) are shown in the following table.

Table 4.1 – Indoor Ambient Noise Levels in Dwellings (BS 8233:2014)

External Noise Level	Façade Sound Insulation standard double glazing + vents	Internal Noise Level
52 dB L_{Aeq} night time	27 dB	25 dB L_{Aeq} night time
56 dB L_{AFMax} night time	27 dB	29 dB L_{AFMax} night time

4.05 There is no issue with respect to garden amenity.

5.00 CONCLUSIONS

- 5.01 A noise impact assessment has been undertaken for a proposed (outline) residential development at land to the north of Station Avenue, Chirk, Wrexham, LL14 5LT.
- 5.02 The ambient noise climate in the southern part of the (red line) application site was road traffic on Station Avenue. The ambient noise climate in the central part of the (red line) application site (representative of the northernmost residential development footprint as the 'thin' wedge of land in the northern part of the application is undeveloped) was distant traffic and relatively quiet distant plant (which was anonymous in character i.e. broadband, not tonal nor impulsive).
- 5.03 The ambient noise levels measured across the site are relatively low. On this basis, the ambient noise climate does not pose a constraint to the proposed residential development.

I trust the foregoing is sufficient for your needs. Should you have any queries regarding the above, please do not hesitate to contact me.

Yours sincerely,

Daniel Bailey
MIOA, Diploma in Acoustics and Noise Control, BSc (Hons)
Environmental Noise Solutions Limited

cc File

Appendix 1

Glossary of Acoustic Terms

Sound Pressure Level (L_p)

The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μ Pa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$$L_p = 20 \log_{10}(p/p_0)$$

Where L_p = sound pressure level in dB; p = rms sound pressure in Pa; and p_0 = reference sound pressure (20 μ Pa).

A-weighting Network

A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

Equivalent continuous A-weighted sound pressure level, $L_{Aeq, T}$

The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, T , has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq, 16h}$ (07:00 to 23:00 hours) and $L_{Aeq, 8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

$L_{A10, T}$

The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T . $L_{A10, 18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

$L_{A90, T}$

The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T . L_{A90} is typically taken as representative of background noise.

$L_{AF \max}$

The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

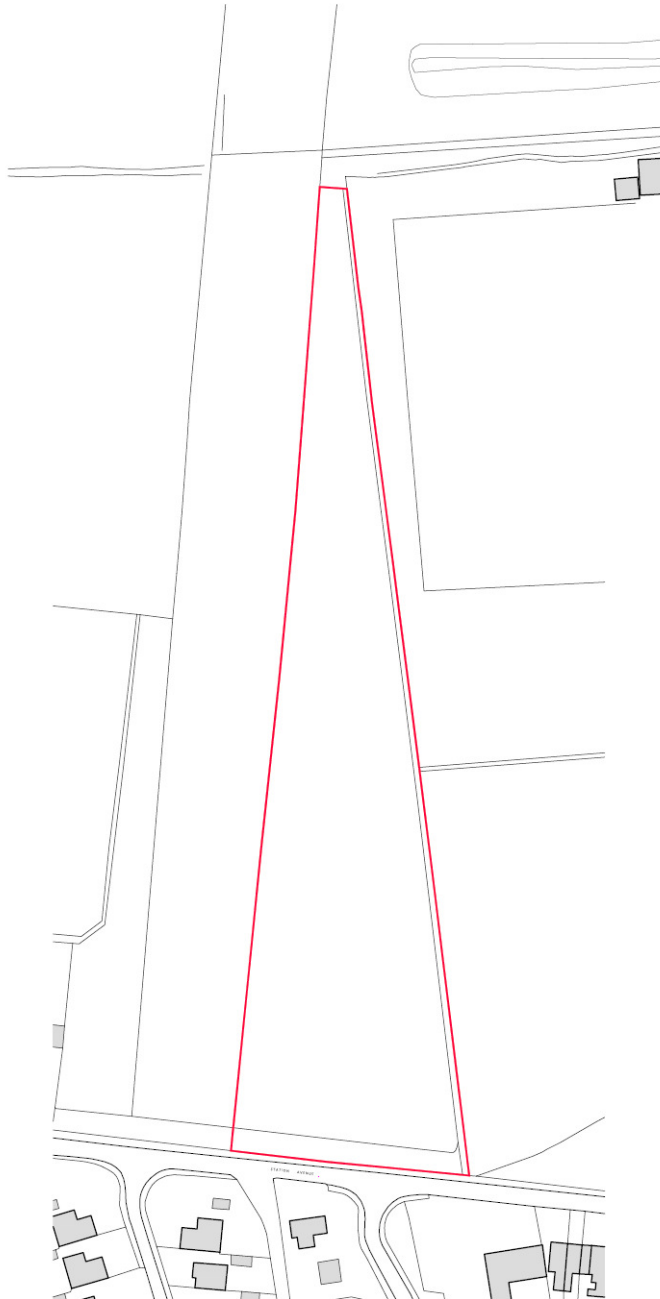
Sound Exposure Level (SEL or L_{AE})

The energy produced by a discrete noise event averaged over one second, no matter how long the event actually took. This allows for comparison between different noise events which occur over different lengths of time.

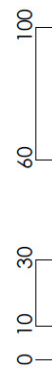
Weighted Sound Reduction Index (R_w)

Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies (R_w is used to characterise the insulation of a material or product that has been measured in a laboratory).

A circle with a vertical line segment extending from the center to the top edge. The letter 'N' is positioned above the circle, centered relative to the vertical line.



SITE LOCATION PLAN @ 1:1250 SCALE

[illegible]

Appendix 3
Aerial Image with Proposed Site Illustrative Master Plan and Noise Monitoring Positions



Appendix 4 Façade Break In Calculation

BRE

1) Enter room dimensions or volume

☒ Use

x m

y m

z m

Volume m³

OR

☒ Use volume

30 m³

Building Envelope Insulation

2) Select elements of facade structure, and enter corresponding internal surface area in m² **OR** enter number of vents.

Surface area OR number of vents

Wall 1	Brick/ block cavity	10.0	m ²
Wall 2	None		m ²
Window 1	4/ 12/ 4 double glazing	1.5	m ²
Window 2	None		m ²
Door	None		m ²
Roof/ Ceiling	Tile/ slate 12.5mm plbd ceiling absorbing layer above	12.0	m ²
Vent 1	Hit and miss trickle (4000mm ²)	2	
Vent 2	None		

View/ Edit Data

Switch to Reverberation Time Calculation

HELP

3) Enter reverberation time of the room.

0.5 seconds

4) Select exterior sound level type

Option (A) ☒ User defined spectrum

52 dB LAeq (night)

View/ Edit Data

Option (B) ☒ Spectrum shape

Select spectrum shape and enter free field exterior sound level, L_{Aeq} (considering only the octave bands between 125Hz and 2kHz)

L_{Aeq} 52 dB

ISO 717 - 1 (C)

View Data

Internal sound level

L_{Aeq} 25.3 dB